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ABSTRACT

The High School Course/Grade Information Section (CGIS) of the American College Testing (ACT) Assessment registration folder collects detailed information about the courses students have taken or plan to take in high school, and the grades they have earned in courses they have completed. In this study, data provided by students on the CGIS were compared with corresponding information from their high school transcripts. Indices of concordance between these two sources were computed concerning 30 courses and grades. Data were obtained from 1,074 students who took the ACT Assessment during the 1985-86 school year. Using criteria developed for the study, it was found that for the typical course, about 10% of the students provided no information, about 87% of the students' statements with respect to whether they took the course could be presumed to agree with their transcripts, and about 3% of the students' statements were inconsistent with information on their transcripts. Of the students who provided no information about a course, most, according to school records, had not taken the course. Among students who reported grades for a course, the typical rate of exact agreement between student-reported and transcript grades was 71%. About 97% of the students reported grades that were within one letter grade of the corresponding transcript grades. The CGIS; descriptions of the sample design, selection, weighting, and representativeness; coding forms used in extracting data from high school transcripts; and further comparisons between student-reported and transcript data are appended. Twelve data tables are included. (Author/TJH)

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ACCURACY OF SELF-REPORTED HIGH SCHOOL COURSES AND GRADES OF COLLEGE-BOUND STUDENTS

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Dedicated to the memory of

RALPH ASCHENBRENNER

1918-1987

Ralph Aschenbrenner was an educator and school administrator for almost 40 years. As a consultant to ACT following his retirement, he coordinated the transcript evaluation phases of this study and of ACT's earlier research in this area. We miss him as a professional, as a colleague, and as a friend.

ABSTRACT

The High School Course/Grade Information Section (CGIS) of the ACT Assessment registration folder collects detailed information about the courses students have taken or plan to take in high school, and the grades they have earned in courses they have completed. In this study, we compared the data provided by students on the CGIS with corresponding information from their high school transcripts. Using criteria developed for the study, we found, for the typical course, that about 10% of the students provided no information; that about 87% of the students' statements with respect to whether they took the course could be presumed to agree with their transcripts; and that about 3% of the students' statements were inconsistent with information on their transcripts. Of the students who provided no information about a course, most, according to school records, had not taken the course. Among students who reported grades for a course, the typical rate of exact agreement between student-reported and transcript grades was 71%. About 97% of the students reported grades that were within 1 letter grade of the corresponding transcript grades.

ACCURACY OF SELF-REPORTED HIGH SCHOOL COURSES AND GRADES OF COLLEGE-BOUND STUDENTS

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Most postsecondary institutions require applicants to supply evidence that their high school background has adequately prepared them to meet the demands of college, university, or technical school coursework. Often, this evidence takes the form of an official high school transcript. Unfortunately, transcripts vary widely among schools. For example, grades may appear as numbers or as letters, based on a variety of scales; the student who earned a "B" in the honors section of English IV may not be distinguishable from the one who earned a "B " in the regular section of that same class; sometimes the name of a given course does not reflect its content; and, of course, there is no common format in which transcripts are prepared.

To simplify the interpretation required, some institutions ask applicants to complete a form listing their high school coursework and the grades they earned. This form is then used, with other materials, in making preliminary admissions decisions, in counseling, and/or in placement. The official transcripts, if required, serve as confirmation of the students' self-reported information.

Similarly, both major college admissions testing programs in the United States--the ACT and the SAT--ask participants to provide information about their high school coursework. This self-reported information, with the test scores and other background information, is sent to colleges designated by the students, where it typically becomes part of their admissions files.

Considerable research has been conducted to investigate the accuracy of self-reported data. Such data have been found to be relatively accurate (Astin, 1965); to be unaffected by incentives to distort responses (Walsh, 1967, 1968); to be more accurate when information more readily available to respondents is requested (Armstrong, Jensen, McCaffrey, & Reynolds, 1976); and, often, to have a level of concurrent and predictive validity comparable to that of test data (Baird, 1976). Pace, Barahona, and Kaplan (1985) made the point that: "The quality of questionnaire answers (reliability, validity, credibility) depends most of all on the quality of the questions"--indicating that, in general, respondents provide accurate data if they understand what is being asked.

When we look more specifically at research related to the accuracy of self-reported courses and grades, we find similar results. Fetters, Stowe, and Owings (1984) asked high school seniors to report the amount of coursework they had completed in a variety of areas. Correlation coefficients between self-reported and transcript data ranged from .28 to .87, although the authors noted that, because of certain methodological characteristics of the study, the coefficients were probably underestimates. They obtained higher coefficients in the more content-specific areas such as foreign languages, science, and mathematics, and lower coefficients in the more content-diverse areas such as history, social studies, English, and literature. In the latter areas, students may have found it more difficult to determine whether they had or had not completed the exact course for which information was requested. The authors also pointed out that, while students were asked to report whether

or not they had taken a course at any time during their academic career, the school-reported data did not include courses taken prior to 9th grade.

Studies of the accuracy of grade reporting have been conducted by Armstrong and Jensen (1974), Armstrong, Jensen, Doyle, and Reynolds (1976), and Fetters et al (1984). Although methodologies differed in the three studies, results were similar, with average correlations between student-reported and transcript grades ranging from .74 to .82.

Students registering for the ACT Assessment are asked to report their most recent grades prior to the senior year in four subject areas: English, mathematics, social studies, and natural sciences. From time to time, ACT has conducted studies to evaluate the accuracy of these data. In the first two such studies, Davidsen (1963) and Richards, Holland, and Lutz (1966) found correlations ranging from .91 to .93 between student-reported and school-reported grades.

Maxey and Ormsby (1971) published a report describing the accuracy with which ACT Assessment-tested students reported both their high school grades and nonacademic achievements. The correlations found between school-reported and student-reported grades ranged from .81 (natural sciences) to .86 (English and mathematics). About 78% of the students reported their grades exactly, and about 98% of them reported their grades accurately to within one letter grade. Follow-up investigation revealed that many of the discrepancies were not due to student misrepresentation. For instance, a student who took two courses simultaneously within the same area sometimes reported the grade for one course, while the school reported the grade for the other. In other

cases, it appeared that the grade lists provided by the schools themselves contained inaccuracies.

In the early 1980's, ACT developed a mechanism to collect more detailed information on students' high school coursework experiences. Valiga (1987) conducted a pilot study in Illinois and Kentucky to determine the accuracy of the new self-reported data. He found that, even when students were not required to have their information certified by high school staff, it corresponded very closely to that on official school transcripts. For example, there was 94% agreement on courses taken, and averages of the student-reported grades correlated .93 with averages of grades shown on the transcripts.

After reviewing the favorable results obtained in the Valiga study, ACT began collecting expanded course and grade information from all ACT Assessment-tested students in the fall of 1985. The High School Course/Grade Information Section (CGIS) of the registration folder for the ACT Assessment is now used to collect detailed information on the courses a student has taken or plans to take in high school, as well as the grades earned in the courses. The CGIS form permits collecting information on 30 standard high school course types. It is reproduced in Appendix A.

This study was designed to determine the accuracy of the self-reported high school courses and grades of college-bound students who took the ACT Assessment. We wanted to determine whether the results reported by Valiga (1987) could be generalized to all students who routinely provide this information on the CGIS when registering for the ACT Assessment. If this

generalization were found to be appropriate, it would appear that colleges and universities could place a high degree of confidence in the accuracy of CGIS data. A further goal of this study was to determine whether different subgroups of ACT-tested students (categorized by sex, racial-ethnic group, ability level, educational level, and date tested) differ significantly in the accuracy with which they report their high school coursework and grades.

Method

Data Collection

Data for this study were obtained from a sample of students who took the ACT Assessment on one or more of the first four national test dates during the 1985-86 academic year. We selected the sample in two stages. In the first stage, we selected a national sample of ACT-user high schools, and in the second, a sample of ACT-tested students from each participating high school. We obtained data from 1,074 students enrolled in 53 high schools. For further details on the design and the selection of the sample, see Appendix B.

In January, 1986, we selected samples of students who were enrolled in the 53 participating schools and who took the ACT Assessment in October or December, 1985. In February, 1986, we wrote to the schools for the transcripts of these students.

In May, 1986, we wrote to the schools for the transcripts of the sample of their students who took the ACT Assessment in February or April, 1986. Because of constraints in the time during which we could collect data from the high schools, we were not able to include in our sample the late registrants for the April test date.

Two former secondary-level educators reviewed the transcripts, extracted the course grade information from them, and transformed the information to a standard format. Because the schools' curricula, grading systems, and transcripts differed widely, these reviewers frequently had to confer with school officials. They used the information they obtained from the school officials, as well as their own knowledge and experience in secondary education, to strive for consistent and accurate interpretation of the transcripts.

The coding forms to which the transcript information was transferred appear in Appendix C. Form 1 was used for schools with a semester or trimester system, and Form 2 was used for schools with a quarter system. Using the appropriate form, the reviewers noted the courses each student had taken when he or she registered for the ACT Assessment, as well as the grades that student received in the courses.

The coding forms also provided for the recording of more than one course of a given type that a student may have taken. In recording such alternate courses, the reviewers indicated whether, in their judgment, they strictly satisfied the definition of the course type listed on the CGIS ("strict alternate"), or whether the courses satisfied only a liberal interpretation of the course type ("liberal alternate"). An example of a strict alternate would be "Short Story" for "English-11th Grade." An example of a liberal alternate would be "Health" for "Biology."

Analysis

The coded transcript data were keyentered, sight-verified, and matched with students' ACT records. For students who took the ACT more than once, only their last matched record was used. The matched data were then checked

for internal consistency by inspecting cross-tabulations of various combinations of the variables recorded. This review resulted in corrections in a few instances.

We then compared the data reported by students on the CGIS with the transcript data coded by the reviewers, and computed indices of concordance between the two sources. We made two general types of comparisons: comparisons of students' reports of courses they took, and comparisons of the grades the students stated they received.

Courses taken. For each student record, we compared the information on courses taken (as declared by the student) with the information we obtained from the student's transcript. For each of the 30 courses in the CGIS, we classified the concordance between student and transcript data in one of the following 9 categories:

Category	Course taken according to... Student	Transcript	More current source
1	missing	...	...
2	yes	yes	...
3	no	no	...
4	yes	no	student
5	yes	no	transcript
6	yes	no	unknown
7	no	yes	student
8	no	yes	transcript
9	no	yes	unknown

Category 1 was assigned when a student provided no information at all about a course, i.e. left the corresponding line on the CGIS blank. Categories 2 and 3 pertain to situations where the student and transcript data agreed with each other. In Category 2, both the student and the transcript indicated that

the student had taken a course; in Category 3, both indicated that the student had not taken a course.

Categories 4-6 pertain to situations where the student claimed to have taken or to be taking a course, but the transcript data did not support the claim. To determine which source of information was more likely to be correct, we examined the data to see which source was more current. The transcripts from some of the participating high schools did not provide information that was as current as could have been provided by the students. For example, most students registered for the February, 1986, administration of the ACT Assessment in December, 1985, and January, 1986; some of the transcripts for these students had not been updated since June, 1985. If the information provided by the student was more current than that provided by the school, then the student's report of taking or having taken a course could very well be correct even though it was not confirmed by the transcript. Some of the transcripts were dated within a month or two of when students probably registered for the ACT Assesment; for these students, it was not possible to determine which source was more current.

For records classified in Category 4 (student data more current than transcript), we considered the student's claim to have taken or to be taking the course as probably correct. For records classified in Category 5 (student data less current than transcript), we considered the transcript data as probably correct. For records classified in Category 6 (more current source of data unknown), it is not possible to say with any confidence which data were more likely to be correct.

Categories 7, 8, and 9 pertain to situations where the student did not claim to have taken or to be taking a course, but the transcript indicated that the student did, in fact, take the course. Few records were classified in these categories, and in all such cases, we considered the transcript data as probably correct.

We computed, for each of the 30 courses in the CGIS, weighted frequencies for the above categories. The weighting was used to project the results in the sample to the population being studied, and is discussed in detail in Appendix B. We also computed weighted frequencies for subgroups of students categorized by their sex, race, educational level (junior or senior), test date, and ACT Composite score, and compared results for the different subgroups.

Course grades. We compared, for each of the 30 courses, the grades reported by the students with the grades obtained from their transcripts. Of course, this comparison was limited to those records for which both the student and the transcript indicated that the student had taken the course and for which the student supplied a grade. The analysis for each course type was based on all the records for which these conditions were true for that particular course type.

Students' varied interpretations of the directions on the CGIS may have affected the grades they reported. For example, they may have reported a six-weeks or quarter grade, rather than an end of term grade; or, they may have reported a grade from a course different from the course(s) our consultants selected from the transcript; or, they may have selected the highest grade that could plausibly be related to a course; or, they may have used various

combinations of these. We examined these possible interpretations of the transcripts:

1. "Last grade". We selected the last grade reported for the course on the transcript. If there was a choice between strict alternate courses (refer to discussion in previous section), we chose the higher of the last grades for the two strict alternates. The last grade is the grade students are supposed to report on the CGIS.
2. "Next-to-last grade". If the last grade was not equal to the student-reported grade, we selected the next-to-last grade available from the transcript. We followed this procedure because the next-to-last transcript grade may have been the most current when the student registered, due to the time lag between registering for and taking the ACT Assessment.

We also considered other interpretations, such as using liberal alternate grades on an equal footing with strict alternate grades, and using the highest grade on the transcript instead of the last grade. These other interpretations typically resulted in concordance frequencies between those of the last grade and next-to-last grade, and for that reason are not discussed here further.

For a given course and student record, let D denote the difference between the student-reported and transcript-reported grade. For each course and for each interpretation of the transcript, we calculated the following statistics:

1. Percentage of records for which $D=0$
2. Percentage of records for which $|D| \leq 1$, where $|D|$ is the absolute value of D
3. Average value of D
4. Average value of $|D|$

We also computed these statistics for subgroups of students classified by sex, race, educational level, test date, and ACT Composite score. We then compared the results for the different subgroups.

For the total group, we also computed, for each course and for each interpretation of the transcript, the correlation coefficient between the student-reported grade and the grade on the transcript. All statistics were weighted to take the sampling design into account (see Appendix B).

Results

Accuracy of Course Reporting

Overall, we found an accuracy level of 87% for students' reporting of the courses they had taken. This figure represents the median accuracy across all 30 courses when both (1) cases in which the student and transcript data agreed and (2) cases in which a discrepancy was apparently due to out-of-date information on the transcript are considered to be accurate. That is, the percentages of students in Categories 2, 3, and 4 (see Method section) were summed for each course before the median accuracy was determined.

It should be noted that some students did not provide information about taking a course. The relative frequency of such students ranged from .03 to .16, depending on the course, with a median value of .10. Of the students who provided no information about a course, most had, in fact, not taken it, according to their transcripts. Such students were not included when calculating the 87% median accuracy rate described in the preceding paragraph.

Table 1 provides summaries of the concordance between student-reported and transcript data for all of the 30 courses. The figures in the columns headed "Consistent Response" and "Inconsistent Response-Student Probably Correct"

TABLE 1

Summary Concordance Between Student Reports and Transcripts of Courses Taken

Course	Student data missing	Consistent response	Inconsistent response: Student probably correct	Inconsistent response: Transcript probably correct	Inconsistent response: Correct source unknown
01-9th grade English	.03	.97	.00+*	.00+	.00+
02-10th grade English	.03	.97	.00+	.00	.00+
03-11th grade English	.03	.93	.04	.00+	.00+
04-12th grade English	.04	.54	.36	.03	.03
05-Speech	.16	.72	.09	.01	.02
06-First-year algebra	.03	.86	.08	.02	.01
07-Second-year algebra	.06	.82	.08	.03	.01
08-Geometry	.05	.90	.04	.01	.00+
09-Trigonometry	.10	.75	.12	.01	.02
10-Calculus	.14	.81	.05	.00+	.01
11-Other math beyond Algebra II	.13	.73	.09	.04	.02
12-Computer math	.11	.71	.07	.11	.01
13-General science	.06	.83	.07	.03	.01
14-Biology	.03	.95	.00+	.01	.00+
15-Chemistry	.07	.86	.05	.01	.01
16-Physics	.12	.78	.09	.00+	.01
17-U.S. history	.03	.94	.03	.00+	.00+
18-World history	.07	.84	.05	.03	.02
19-Other history	.16	.66	.06	.11	.02
20-American govt.	.07	.65	.20	.05	.03
21-Economics	.13	.66	.16	.01	.04
22-Geography	.14	.76	.06	.03	.01
23-Psychology	.14	.76	.09	.00+	.01
24-Spanish	.10	.87	.03	.00+	.00+
25-French	.14	.85	.01	.01	.00+
26-German	.15	.84	.01	.00+	.00
27-Other languages	.16	.82	.02	.00	.00+
28-Art	.11	.78	.07	.03	.01
29-Music	.11	.81	.05	.02	.01
30-Drama	.15	.82	.02	.01	.01

*Throughout the tables in this paper, the designation ".00+" denotes a number less than .005, but greater than zero. The designation ".00" denotes zero exactly.

reflect assumed accurate reporting by the students. For example, for Course 4, (12th-grade English), the student reports and transcripts agreed for 54% of the cases. In 36% of the cases, the transcripts of seniors had not been updated to include 12th-grade coursework; we assume that these students were, in fact, enrolled in 12th-grade English as claimed. Thus, we considered the 90% accuracy rate for this course to be 90%.

Across the 30 courses, accurate reporting ranged from 72% (Other history) to 97% (9th, 10th, and 11th-grade English). The courses with the lowest concordances were Other math, Other history, Computer math, and Speech. These courses' titles are broader in meaning than the titles of the other courses; moreover, although these courses are listed separately on the CGIS, schools often incorporate their content into other courses. The courses with the highest concordances were U.S. History, Geometry, Biology, and 9th through 11th-grade English.

Tables providing a detailed description of the concordance between student- and school-reported data for each of the 30 courses are contained in Appendix D. These tables show weighted proportions for all 9 categories described in the Method section.

After performing analyses for the total group, we also analyzed data separately by race (black, white), sex, ACT Composite score (<15, 15-22, >22), test date (October, December, February, April), and educational level (junior, senior). Differences in accuracy of course reporting across these subgroups were, except in a few cases, less than 5%. There tended to be greater variation in accuracy among test dates than among other subgroupings of students, but no single test date was associated with uniformly more accurate reporting.

Accuracy of Grade Reporting

For each of the 30 courses, the last grade reported by the student was compared with the transcript grade. The median values and ranges (across all 30 courses) for the five different indices of grade accuracy were as follows:

	Median	Range
Percentage of students for which D = 0	71%	64%-85%
Percentage of students for which $\|D\| \leq 1$	97%	91%-100%
Average value of D	.23	.13-.32
Average value of $\|D\|$	.33	.15-.41
Correlation between student-reported and transcript grade	.80	.53-.89

Table 2 shows the values of these five indices for each course. The courses with the highest correlations between student-reported and transcript grades were Geometry, Trigonometry, Chemistry, and Psychology; the courses with the lowest correlations were Music, Drama, Other Math, and Other History.

Recall that, in a substantial proportion of cases, the student-reported and school-reported data were not contemporaneous; that is, one source was more up-to-date than the other. Therefore, when the last grade reported by the student did not match the transcript grade, we checked to see whether the next-to-last grade reported by the student agreed with that shown on the transcript. If the next-to-last grade did match, we substituted it for the last grade. This procedure resulted in a slightly higher level of accuracy when we calculated the indices. A table showing the five indices of accuracy for each course when next-to-last grades were included appears as Appendix D.

Data were also analyzed separately for the subgroups previously described. Generally, subgroup results were similar to those of the total

TABLE 2

Summary Concordance Between Student Reports and Transcript Grades

Course	Concordance index				
	Proportion D=0	Proportion |D| ≤ 1	Average D	Average |D|	Correlation
01-9th grade English	.67	.96	.27	.28	.76
02-10th grade English	.71	.97	.22	.33	.79
03-11th grade English	.75	.97	.17	.28	.82
04-12th grade English	.70	.97	.22	.33	.77
05-Speech	.76	.98	.13	.26	.75
06-First-year algebra	.69	.96	.23	.37	.78
07-Second-year algebra	.74	.95	.25	.32	.80
08-Geometry	.76	.98	.19	.27	.87
09-Trigonometry	.76	.98	.20	.26	.89
10-Calculus	.85	1.00	.15	.15	.82
11-Other math beyond Algebra II	.81	.97	.18	.24	.69
12-Computer math	.73	.97	.23	.30	.80
13-General science	.67	.95	.27	.39	.75
14-Biology	.68	.96	.25	.36	.79
15-Chemistry	.76	.97	.18	.27	.87
16-Physics	.77	.96	.23	.27	.84
17-U.S. history	.70	.97	.25	.33	.81
18-World history	.68	.96	.25	.36	.79
19-Other history	.66	.93	.25	.40	.70
20-American govt.	.64	.96	.23	.41	.75
21-Economics	.80	.98	.14	.22	.86
22-Geography	.68	1.00	.21	.32	.82
23-Psychology	.78	.98	.21	.24	.87
24-Spanish	.65	.97	.32	.38	.84
25-French	.69	.98	.25	.33	.81
26-German	.69	.92	.21	.41	.77
27-Other languages	.67	.98	.26	.34	.79
28-Art	.71	.98	.24	.31	.80
29-Music	.81	.97	.13	.22	.54
30-Drama	.71	.91	.30	.38	.53

group, except that females and students with higher ACT Composite scores appeared to provide somewhat more accurate data. For instance, the median percentage of students with D = 0 (that is, whose reported grade agreed exactly with the transcript grade) was .69 for males and .75 for females; it was .63 for students with ACT Composite scores less than 15, .71 for students with Composite scores of 15-22, and .80 for students with Composite scores above 22. The median average value of D was .23 for the total group. The corresponding median value was .26 for males and .20 for females; it was .32 for students with ACT Composite scores less than 15, .21 for students with Composite scores of 15-22, and .16 for students with Composite scores above 22.

Discussion

Accuracy of Course Reporting

We found a range of 72% to 97% over the 30 courses in the accuracy of students' reports of courses taken; the median accuracy was 87%. We believe these percentages reflect a high level of accuracy, especially when it is noted that, in cases where the concordances between student and transcript data were lowest, we typically found that an unusually high proportion of students had left the items blank. For example, 16% of students did not supply information for Speech, Other History, and Other Languages; 15% for German and Drama; and 14% for Calculus, Geography, Psychology, and French. As we did not adjust the accuracy results for missing data, the true accuracy rates are likely to be higher than indicated above.

Accuracy of course reporting appeared to be similar for all subgroups studied, except when subgroups were formed on the basis of test date. We

believe that variations by test date are probably related to the fact that most schools require some time to update their transcripts after the end of a grading period. Students who registered for the ACT Assessment just after the end of a grading period (which was more likely for some test dates than for others) may well have provided us with more up-to-date information than was available from the transcripts we received. While we attempted to compensate for this by checking the dates on the transcripts, we found that, in many cases, the transcript date represented the date the transcript was mailed, and not the date on which information was last added.

Accuracy of Grade Reporting

Our median correlation of .80 (range .53-.89) between student- and school-reported grades is consistent with the findings of the previous research described in the introduction. In common with some other investigators, we found accuracy to be higher for more content-specific courses (e.g., Chemistry) than for more content-diverse courses (e.g., Other History).

All students had a slight tendency to overreport (for the total group, the average value of the difference between student- and transcript-reported grade was .23). There were some differences in accuracy among subgroups of students categorized by sex and by ACT Composite score, with females and students with higher scores reporting more accurately. Since students with lower scores tended to have lower grades, there was more "room" for these students to overreport. It would not, of course, be possible for a straight-A student to overreport; any misreporting would have to be in the other direction.

Conclusions

In general, we feel that the accuracy of student reporting of courses taken and grades received at the time of registration for the ACT Assessment is sufficiently high to be useful in many contexts. For instance, we expect these data to be suitable for initial screening of college applicants, for course placement, and in research where the focus is on group data. However, accuracy of such reporting showed sufficient diversity among students for us to recommend that when a major decision (e.g., admission to college, granting of a scholarship) is dependent on these criteria, official school certification of courses taken and grades received should be obtained.

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Appendix A

The Course/Grade Information Section

of the ACT Assessment Registration Folder

PAGE 2

USE A SOFT LEAD PENCIL ONLY

HIGH SCHOOL COURSE/ GRADE INFORMATION

This section lists 30 high school courses. Indicate whether or not you have taken or plan to take each course and, if you have taken it, the last grade you earned. You may wish to refer to your previous high school grade reports or a copy of your current high school transcript. The information you provide will be sent to the colleges you indicate on page 4 of this folder.

For further instructions, see page 4 of *Registering for the ACT Assessment*. After you have completed this section, sign the certification statement at the top of this page.

STUDENT'S SIGNATURE: I hereby certify that the course and grade information provided below is accurate and complete to the best of my knowledge. (I realize that this information may be verified at a later time by college personnel.)

Student's Signature *Date*

		COURSES TAKEN OR PLANNED			GRADES EARNED				
		Indicate whether or not you have taken each of the high school courses listed below and, if not, whether you plan to take the courses before you finish high school. Be sure to blacken one oval for **EACH** subject, **even those you have not taken.**			For each course you have completed or have taken for a full term (semester, quarter, etc.) indicate the **final** grade (last grade) you received. If you took the course for more than one term, report only the **LAST** term grade you received. Convert numeric grades to the corresponding letter grades. Round to the closest letter grade if necessary. Leave blank if you have not yet completed a full term of the subject or if a grade was not awarded for the course.				
		HAVE TAKEN OR AM TAKING: (*I have completed or am now enrolled in this subject.*)	**HAVE NOT TAKEN, BUT WILL:** (*I have not taken this subject, but plan to take it prior to graduation.*)	**HAVE NOT TAKEN, AND WILL NOT:** (*I have not taken and do not plan to take this subject.*)	**A**	**B**	**C**	**D**	**F**
ENG.	English taken during the 9th grade	0	0	0	0	0	0	0	0
	English taken during the 10th grade	0	0	0	0	0	0	0	0
	English taken during the 11th grade	0	0	0	0	0	0	0	0
	English taken during the 12th grade	0	0	0	0	0	0	0	0
	Speech	0	0	0	0	0	0	0	0
MATH	First-year Algebra (Algebra I; not pre-Algebra)	0	0	0	0	0	0	0	0
	Second-year Algebra (Algebra II)	0	0	0	0	0	0	0	0
	Geometry	0	0	0	0	0	0	0	0
	Trigonometry	0	0	0	0	0	0	0	0
	Calculus (not pre-Calculus)	0	0	0	0	0	0	0	0
	Other Math beyond Algebra II	0	0	0	0	0	0	0	0
	Computer Math/Computer Science	0	0	0	0	0	0	0	0
NAT. SCI.	General/Physical/Earth Science	0	0	0	0	0	0	0	0
	Biology	0	0	0	0	0	0	0	0
	Chemistry	0	0	0	0	0	0	0	0
	Physics	0	0	0	0	0	0	0	0
SOC. STUDIES	U.S. History (American History)	0	0	0	0	0	0	0	0
	World History/World Civilization	0	0	0	0	0	0	0	0
	Other History (European, State, etc.)	0	0	0	0	0	0	0	0
	American Government/Civics	0	0	0	0	0	0	0	0
	Economics (Consumer Economics)	0	0	0	0	0	0	0	0
	Geography	0	0	0	0	0	0	0	0
	Psychology	0	0	0	0	0	0	0	0
LANG.	Spanish	0	0	0	0	0	0	0	0
	French	0	0	0	0	0	0	0	0
	German	0	0	0	0	0	0	0	0
	Other Language	0	0	0	0	0	0	0	0
ARTS	Art (painting, etc.)	0	0	0	0	0	0	0	0
	Music (vocal or instrumental)	0	0	0	0	0	0	0	0
	Drama/Theater (if taken as a course)	0	0	0	0	0	0	0	0

INTEREST INVENTORY

The ACT Interest Inventory and the Student Profile Section (on page 5) are important parts of the ACT Assessment. The items in each deal with you—your educational interests, goals, plans, and accomplishments.

You should complete the Interest Inventory and the Student Profile Section as carefully and accurately as you can. Much of the information on the reports sent to you and to the colleges you select is based on your responses to these two sections.

1 ⓐ ⓑ ⓒ	31 ⓐ ⓑ ⓒ	61 ⓐ ⓑ ⓒ
2 ⓐ ⓑ ⓒ	32 ⓐ ⓑ ⓒ	62 ⓐ ⓑ ⓒ
3 ⓐ ⓑ ⓒ	33 ⓐ ⓑ ⓒ	63 ⓐ ⓑ ⓒ
4 ⓐ ⓑ ⓒ	34 ⓐ ⓑ ⓒ	64 ⓐ ⓑ ⓒ
5 ⓐ ⓑ ⓒ	35 ⓐ ⓑ ⓒ	65 ⓐ ⓑ ⓒ
6 ⓐ ⓑ ⓒ	36 ⓐ ⓑ ⓒ	66 ⓐ ⓑ ⓒ
7 ⓐ ⓑ ⓒ	37 ⓐ ⓑ ⓒ	67 ⓐ ⓑ ⓒ
8 ⓐ ⓑ ⓒ	38 ⓐ ⓑ ⓒ	68 ⓐ ⓑ ⓒ
9 ⓐ ⓑ ⓒ	39 ⓐ ⓑ ⓒ	69 ⓐ ⓑ ⓒ
10 ⓐ ⓑ ⓒ	40 ⓐ ⓑ ⓒ	70 ⓐ ⓑ ⓒ
11 ⓐ ⓑ ⓒ	41 ⓐ ⓑ ⓒ	71 ⓐ ⓑ ⓒ
12 ⓐ ⓑ ⓒ	42 ⓐ ⓑ ⓒ	72 ⓐ ⓑ ⓒ
13 ⓐ ⓑ ⓒ	43 ⓐ ⓑ ⓒ	73 ⓐ ⓑ ⓒ
14 ⓐ ⓑ ⓒ	44 ⓐ ⓑ ⓒ	74 ⓐ ⓑ ⓒ
15 ⓐ ⓑ ⓒ	45 ⓐ ⓑ ⓒ	75 ⓐ ⓑ ⓒ
16 ⓐ ⓑ ⓒ	46 ⓐ ⓑ ⓒ	76 ⓐ ⓑ ⓒ
17 ⓐ ⓑ ⓒ	47 ⓐ ⓑ ⓒ	77 ⓐ ⓑ ⓒ
18 ⓐ ⓑ ⓒ	48 ⓐ ⓑ ⓒ	78 ⓐ ⓑ ⓒ
19 ⓐ ⓑ ⓒ	49 ⓐ ⓑ ⓒ	79 ⓐ ⓑ ⓒ
20 ⓐ ⓑ ⓒ	50 ⓐ ⓑ ⓒ	80 ⓐ ⓑ ⓒ
21 ⓐ ⓑ ⓒ	51 ⓐ ⓑ ⓒ	81 ⓐ ⓑ ⓒ
22 ⓐ ⓑ ⓒ	52 ⓐ ⓑ ⓒ	82 ⓐ ⓑ ⓒ
23 ⓐ ⓑ ⓒ	53 ⓐ ⓑ ⓒ	83 ⓐ ⓑ ⓒ
24 ⓐ ⓑ ⓒ	54 ⓐ ⓑ ⓒ	84 ⓐ ⓑ ⓒ
25 ⓐ ⓑ ⓒ	55 ⓐ ⓑ ⓒ	85 ⓐ ⓑ ⓒ
26 ⓐ ⓑ ⓒ	56 ⓐ ⓑ ⓒ	86 ⓐ ⓑ ⓒ
27 ⓐ ⓑ ⓒ	57 ⓐ ⓑ ⓒ	87 ⓐ ⓑ ⓒ
28 ⓐ ⓑ ⓒ	58 ⓐ ⓑ ⓒ	88 ⓐ ⓑ ⓒ
29 ⓐ ⓑ ⓒ	59 ⓐ ⓑ ⓒ	89 ⓐ ⓑ ⓒ
30 ⓐ ⓑ ⓒ	60 ⓐ ⓑ ⓒ	90 ⓐ ⓑ ⓒ

Appendix B

Sample Design, Sample Selection, Weighting, and Representativeness of the Sample

Appendix B

Sample Design

The target population for this study consisted of students who took the ACT Assessment on a national test date during the 1985-86 academic year. There are five national test dates for the ACT Assessment: in October, December, February, April, and June. In this study we collected the high school grades of a sample of students who took the ACT Assessment on the October, December, February, or April test dates. We did not collect data from June-tested students because of practical constraints on the time allowed to complete the study and because high school staff are usually not available to assist with data collection during the summer. We studied the potential biasing effects of excluding the June-tested students (see discussion below), but found no biases.

We selected the sample for this study in two stages. In the first stage, we selected a national sample of ACT-participating high schools from a specially constructed sampling frame. In the second stage, we selected a sample of the ACT-tested students from each participating high school and from each of the four national test dates October-April.

The sampling frame was a magnetic tape file of the 17,565 high schools in the U.S. (grades 10-12) at which there was one or more ACT-tested student during the 1984-85 academic year. The frame was stratified by the following variables: affiliation (local public/county or state/private non-Catholic/ Catholic), SES (percent of population in district with incomes below the federal poverty level), and ACT test volume in 1984-85. We selected from each stratum a systematic (1-out-of-k) random sample. The strata and the number of schools selected from each are summarized in Table B.1.

TABLE B.1

Stratification of First-Stage Sample

Stratum	Affiliation	SES	ACT test volume	Number of schools: Sampling frame	Desired sample	Obtained sample
01	Public	0-4.9% BFPL	1-38	772	2	2
02			39-140	363	2	2
03			141+	313	5	5
04		5.0-11.9% BFPL	1-38	2799	2	2
05			39-140	1186	5	5
06			141+	389	5	5
07		12.0-24.9% BFPL	1-38	3918	3	1
08			39-140	1379	6	7
09			141+	314	4	4
10		25.0%+ BFPL	1-38	1692	2	2
11			39-140	522	2	2
12			141+	87	2	2
13		SES unk.	---	274	2	2
14	County/state	---	---	97	2	2
15	Private non-Cath.	---	1-26	1943	2	1
16		---	27+	376	2	3
17	Catholic	---	1-92	880	2	2
18		---	93+	266	3	4
			(Total)	17565	53	53

Notes:

1. Dashes (---) in the column for a stratification variable indicate that the variable was not used to define the stratum.

2. BFPL = below federal poverty level. The percentages refer to the population in the district served by the school. No SES data were available for private non-Catholic and Catholic schools.

The sample of schools was also implicitly stratified on geographical region. This was accomplished by sorting the sampling frame on region within explicit stratum before selecting the systematic random sample. There were six geographical regions, and they were taken to be the six ACT service regions defined in College Student Profiles (ACT, 1987).

Sample Selection

Three times as many schools were selected and invited to participate in this study as were actually needed for the sample. We sent a letter to each school, inviting it to participate and explaining the goals and methods of the study. We offered to pay each participating school its usual fee, if any, for producing transcripts.

In some strata, the desired numbers of schools were not achieved from the primary sample, and schools from a backup sample were contacted. Quotas were not attained in two of the strata, but the overall sample size of 53 schools was attained. Between 20 and 30 other schools were willing to participate, but were not used because we exceeded the quotas in their strata. The number of schools actually participating in the study is about 29% of the number of schools invited to participate.

We next selected, within each sampled high school, a systematic random sample of students from each of the four test dates. The within-school sample size was taken to be approximately five students per test date, though small variations from this were made when another sample size more nearly evenly divided the total number of ACT-tested students in the school. At schools with fewer than five ACT-tested students per test date, all students were selected.

The sample was designed so that the following precision in estimated student proportions would be attained: For a proportion (p) of students near

.50, there would be a 95% chance that the estimated proportion would differ from p by .05 or less. Moreover, the coefficient of variation of sample size should be less than .10; this latter condition is necessary to minimize bias in the statistical estimation procedures (Kish, 1965, pp. 208-209).

Weighting

The sample design resulted in varying probabilities of selecting both schools and students within schools. It was, therefore, necessary to weight the student records to reflect these differences. The weight for a student record was taken to be inversely proportional to its probability of selection:

$$W_{hij}^{-1} = (n_h/N_h) * (m_{hij}/M_{hij}),$$

where W_{hij} the weight for a record from test date j, school i, and stratum h;

n_h is the number of schools in the sample from stratum h;

N_h is the number of schools in the sampling frame from stratum h;

m_{hij} is the number of students in the sample from test date j, school i, and stratum h.

M_{hij} is the number of students tested on test date j from school i in stratum h.

The effect of the weighting is to project the sample back to the population from which it was selected, i.e. the students who took the ACT Assessment on the first four test dates of the 1985-86 academic year.

Representativeness of the sample

Note that the sum of the weights over all records in the sample, W_{hij}, is the total projected test volume from the schools represented in the sampling frame for the four test dates included in this study. This sum is equal to 706,054, which is about 12% less than the actual volume of 799,013

for these four test dates. The difference between projected and actual test volumes is due to the following reasons:

1. Only the last record was used for students who took the ACT Assessment more than once.
2. Students who gridded an invalid high school code were excluded from the sample. About 6% of all students do not grid a valid high school code.
3. Late registrants for the April, 1986 test date were not included in the sample.
4. Students who took the ACT Assessment in 1985-86 and who were enrolled in schools that had zero test volume in 1984-85 were not represented in the sample.

These groups of students were excluded because of practical constraints on the execution of the study. To investigate the possibility that their exclusion had a biasing effect on the results, we computed weighted frequency distributions for the variables race and sex, as well as the weighted mean ACT Composite score. These statistics are compared in Table B.2 with corresponding statistics for all students who tested on the four national test dates October, 1985 to April, 1986. The comparison suggests that females and blacks were slightly over-represented in the sample and that males and whites were slightly under-represented. Moreover, the weighted mean ACT Composite score estimated from the sample was 0.8 units lower than the mean ACT Composite score of all students tested. On the other hand, the accuracy of students' reports of courses taken and the accuracy of their self-reported grades in these courses were not strongly related to sex, racial/ethnic background, and ACT Composite score. It is, therefore, unlikely that the

TABLE B.2

Distribution of Sex and Racial Ethnic Backgrounds, and Mean ACT Composite Score of Students

		Source	
			ACT-tested students
Variable	Subgroup	Sample	Oct. 1985–Apr. 1986
Sex	Females	.57	.54
	Males	.43	.46
Racial/ethnic background	Afro-American/Black	.13	.08
	American Indian, Alaskan Native	.01	.01
	Caucasian-American/White	.78	.82
	Mexican-American/Chicano	.02	.02
	Asian-American, Pacific Islander	.02	.02
	Puerto Rican, Cuban, Other Hispanic Origin	.01	.02
	Other	.01	.01
	I Prefer Not to Respond	.02	.03
ACT Composite score	(mean)	17.8	18.6

Notes: 1. Statistics from "Sample" were weighted to reflect the sampling design.

2. The distribution of racial/ethnic background for "ACT-tested students" is based on data from all 5 national test dates in 1985-86, rather than just from the first 4 national test dates.

unrepresentativeness noted above has distorted the results to any significant degree. Any biases that are present are likely to have had the effect of making the student-reported data seem slightly less accurate than they really are.

To explore further the possibility that excluding the June, 1986 test date from the study had a biasing effect on the results, another

weight $W_{hijk} = W_{hij}$ for j = October, December, and February test dates

$= C(k) * W_{hij}$ for j = April test date,

was computed. In this modification of W_{hij}, C(k) is a constant that depends on a student's grade classification k. The motivation for this modification is as follows: Students who test in June are more like the students who test in April than they are like students who test on any other date. Most April and June-tested students tend to be juniors and to earn higher than average ACT scores; seniors who test in April or June tend to be less certain about attending college and to have much lower than average ACT scores. The synthetic weight W_{hijk} is based on projecting the results for April-tested students by grade level to represent April and June-tested students combined.

The results for the synthetic weighting were very similar to those for the primary weighting. This suggests that excluding the June-tested students did not appreciably alter the findings of this study.

Appendix C

Coding Forms Used in Extracting Data from High School Transcripts

Course Grade Verification Study
Coding Form #1

SEQNO [ ][ ][ ][ ] HSCODE [ ][ ][ ][ ][ ][ ]

Name [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] SSN [ ][ ][ ][ ][ ][ ][ ][ ][ ]

Transcript date M O [ ][ ] Y R [ ][ ] GPA [ ].[ ][ ]

Transcript class level [ ] Class Rank [ ][ ][ ] of [ ][ ][ ]

Course	Have Taken	Primary course					Alternative course				
		Class	SEM1	SEM2	Final	Comments	Class	SEM1	SEM2	Final	Comments
1. English 9th grade											
2. English 10th grade											
3. English 11th grade											
4. English 12th grade											
5. Speech											
6. 1st-year Alg.											
7. 2nd-year Alg.											
8. Geometry											
9. Trigonometry											
10. Calculus											
11. Other Math											
12. Computer M/S											
13. Gen./Phys./Earth											
14. Biology											
15. Chemistry											
16. Physics											
17. U.S. History											
18. World History/Civ.											
19. Other History											
20. American Govt.											
21. Economics											
22. Geography											
23. Psychology											
24. Spanish											
25. French											
26. German											
27. Other Language											
28. Art(painting, etc.)											
29. Music											
30. Drama/Theater											

Comments:

Quarter System

Test Date _____

Course Grade Verification Study
Coding Form #2

SEQNO ☐☐☐☐ HSCODE ☐☐☐☐☐☐

Name ☐☐☐☐☐☐☐☐☐☐☐☐☐☐ SSN ☐☐☐☐☐☐☐☐☐

Transcript date M O ☐☐ Y R ☐☐ GPA ☐.☐☐

Transcript class level ☐ Class Rank ☐☐☐ of ☐☐☐

Course	Have Taken	Primary course							Alternative course						
		Class	Q1	Q2	Q3	Q4	Final	Comments	Class	Q1	Q2	Q3	Q4	Final	Comments
1. English 9th grade															
2. English 10th grade															
3. English 11th grade															
4. English 12th grade															
5. Speech															
6. 1st-year Alg.															
7. 2nd-year Alg.															
8. Geometry															
9. Trigonometry															
10. Calculus															
11. Other Math															
12. Computer H/S															
13. Gen./Phys./Earth															
14. Biology															
15. Chemistry															
16. Physics															
17. U.S. History															
18. World History/Civ.															
19. Other History															
20. American Govt.															
21. Economics															
22. Geography															
23. Psychology															
24. Spanish															
25. French															
26. German															
27. Other Language															
28. Art(painting, etc.)															
29. Music															
30. Drama/Theater															

Comments:

Appendix D

Further Comparisons Between Student-Reported and Transcript Data on Courses Taken and Grades Earned

Table D.1

Concordance Between Student Reports and Transcripts of English Courses Taken

Category	Course taken according to... Student	Transcript	More current source	English course 01 9th grade	02 10th grade	03 11th grade	04 12th grade	05 Speech
01	missing	...	...	.03	.03	.03	.04	.16
02	yes	yes	...	.97	.97	.93	.24	.15
03	no	no	...	.00	.00	.00+	.30	.57
04	yes	no	student	.00+	.00+	.04	.36	.09
05	yes	no	transcript	.00	.00	.00	.00+	.00+
06	yes	no	unknown	.00+	.00+	.00+	.03	.02
07	no	yes	student	.00+	.00	.00+	.01	.01
08	no	yes	transcript	.00	.00	.00	.00	.00
09	no	yes	unknown	.00	.00	.00	.01	.00+

Table D.2

Concordance Between Student Reports and Transcripts of Mathematics Courses Taken

Category	Course taken according to... Student	Transcript	More current source	Course 06 First-year algebra	07 Second-year algebra	08 Geometry	09 Trigonometry	10 Calculus	11 Other math	12 Computer math
01	missing	...	...	.03	.06	.05	.10	.14	.13	.11
02	yes	yes	...	.82	.59	.74	.19	.01	.07	.26
03	no	no	...	.03	.23	.17	.56	.80	.66	.45
04	yes	no	student	.08	.08	.04	.12	.05	.09	.07
05	yes	no	transcript	.00	.00+	.00	.00+	.00+	.00+	.00+
06	yes	no	unknown	.01	.01	.00+	.02	.01	.02	.01
07	no	yes	student	.01	.02	.01	.01	.00	.03	.07
08	no	yes	transcript	.00	.00	.00	.00	.00	.00	.00
09	no	yes	unknown	.01	.01	.00+	.00+	.00+	.01	.04

Table D.3

Concordance Between Student Reports and Transcripts of Natural Science Courses Taken

Category	Course taken according to... Student	Transcript	More current source	Natural science course 13 General science	14 Biology	15 Chemistry	16 Physics
01	missing	...	...	.06	.03	.07	.12
02	yes	yes	...	.67	.91	.51	.09
03	no	no	...	.16	.04	.35	.69
04	yes	no	student	.07	.00+	.05	.09
05	yes	no	transcript	.00+	.00	.00+	.00+
06	yes	no	unknown	.01	.00+	.01	.01
07	no	yes	student	.02	.01	.01	.00+
08	no	yes	transcript	.00	.00	.00	.00
09	no	yes	unknown	.00+	.00+	.00+	.00+

Table D.4

Concordance Between Student Reports and Transcripts of Social Studies Courses Taken

Category	Course taken according to... Student	Transcript	More current source	Social studies course 17 U.S. history	18 World history	19 Other history	20 American govt	21 Economics	22 Geography	23 Psychology
01	missing	...	...	.03	.07	.16	.07	.13	.14	.14
02	yes	yes	...	.92	.53	.17	.34	.09	.17	.12
03	no	no	...	.01	.31	.49	.31	.58	.60	.64
04	yes	no	student	.03	.05	.06	.20	.16	.06	.09
05	yes	no	transcript	.00	.00+	.00+	.00+	.00+	.00+	.00+
06	yes	no	unknown	.00+	.02	.02	.03	.04	.01	.01
07	no	yes	student	.00+	.02	.10	.04	.00+	.02	.00+
08	no	yes	transcript	.00	.00+	.00+	.00	.00+	.00	.00
09	no	yes	unknown	.00	.00+	.01	.01	.00+	.01	.00+

Table D.5

Concordance Between Student Reports and Transcripts of Language Courses Taken

Category	Course taken according to... Student	Transcript	More current source	Language course 24 Spanish	25 French	26 German	27 Other language
01	missing	...	...	.10	.14	.15	.16
02	yes	yes	...	.39	.18	.07	.06
03	no	no	...	.48	.67	.78	.77
04	yes	no	student	.03	.01	.01	.02
05	yes	no	transcript	.00	.00	.00	.00
06	yes	no	unknown	.00+	.00+	.00	.00+
07	no	yes	student	.00+	.00+	.00+	.00
08	no	yes	transcript	.00	.00	.00	.00
09	no	yes	unknown	.00	.00+	.00	.00

Table D.6

Concordance Between Student Reports and Transcripts of Arts Courses Taken

Category	Course taken according to... Student	Transcript	More current source	28 Art	29 Music	30 Drama
01	missing	...	...	.11	.11	.15
02	yes	yes	...	.21	.35	.07
03	no	no	...	.57	.46	.74
04	yes	no	student	.07	.05	.02
05	yes	no	transcript	.00+	.00+	.00+
06	yes	no	unknown	.01	.01	.01
07	no	yes	student	.02	.02	.01
08	no	yes	transcript	.00	.00	.00
09	no	yes	unknown	.01	.01	.00+

TABLE D.7

Summary Concordance Between Student Reported Grade and NEXT-TO-LAST Transcript Grade

Course	Concordance index				
	Proportion D=0	Proportion |D| ≤ 1	Average D	Average |D|	Correlation
01-9th grade English	.76	.97	.20	.27	.82
02-10th grade English	.81	.97	.16	.23	.82
03-11th grade English	.82	.98	.16	.21	.85
04-12th grade English	.71	.96	.22	.33	.75
05-Speech	.76	.99	.13	.25	.77
06-First-year algebra	.78	.96	.15	.28	.81
07-Second-year algebra	.81	.96	.18	.25	.81
08-Geometry	.84	.98	.13	.18	.90
09-Trigonometry	.84	.99	.10	.17	.92
10-Calculus	.85	1.00	.30	.30	.50
11-Other math beyond Algebra II	.82	.97	.16	.23	.68
12-Computer math	.77	.78	.17	.26	.82
13-General science	.74	.97	.20	.30	.77
14-Biology	.77	.96	.18	.28	.82
15-Chemistry	.82	.97	.14	.21	.89
16-Physics	.78	.96	.21	.25	.85
17-U.S. history	.79	.97	.19	.25	.84
18-World history	.78	.96	.22	.26	.84
19-Other history	.66	.93	.25	.40	.71
20-American govt.	.69	.96	.21	.36	.77
21-Economics	.80	.98	.14	.22	.86
22-Geography	.72	1.00	.19	.29	.83
23-Psychology	.81	.98	.19	.22	.88
24-Spanish	.73	.98	.25	.30	.84
25-French	.80	.99	.14	.22	.86
26-German	.75	.93	.12	.36	.76
27-Other languages	.73	.98	.19	.28	.81
28-Art	.74	.97	.22	.29	.81
29-Music	.85	.97	.11	.19	.57
30-Drama	.81	.96	.18	.24	.70